



BOTANY, PAPER-I

TIME ALLOWED:	(PART-I) 30 MINUTES	MAXIMUM MARKS:20
	(PART-II) 2 HOURS & 30 MINUTES	MAXIMUM MARKS:80

- NOTE: (i) First attempt PART-I (MCQ) on separate Answer Sheet which shall be taken back after 30 minutes.**
(ii) Overwriting/cutting of the options/answers will not be given credit.

PART – I (MCQ)
(COMPULSORY)

Q.1. Select the best option/answer and fill in the appropriate box on the Answer Sheet. (20)

- (i) The Green Algae belongs to:
 - (a) Cyanochloranta
 - (b) Chlorophycophyta
 - (c) Charophyta
 - (d) Cryptophycophyta
 - (e) None of these
- (ii) If the gametes and gametangia in Fungi are of unequal size, they are termed as:
 - (a) Heterothallic
 - (b) Homothallic
 - (c) Isogametes
 - (d) Anisogametes
 - (e) None of these
- (iii) Chlorophyll 'd' exists in:
 - (a) Pyrrophyta
 - (b) Phaeophyta
 - (c) Cryptophyta
 - (d) Rhodophyta
 - (e) None of these
- (iv) Which of the type of chlorophyll is rare in Xanthophyceae and has been determined in only two of its genera:
 - (a) chlorophyll 'a'
 - (b) chlorophyll 'e'
 - (c) chlorophyll 'b'
 - (d) chlorophyll 'd'
 - (e) None of these
- (v) The Axoneme in an algal filament is composed of _____ fibrils:
 - (a) five
 - (b) seven
 - (c) eleven
 - (d) one
 - (e) None of these
- (vi) An antibiotic called "Chlorellin" is derived from:
 - (a) Chara
 - (b) Spirogyra
 - (c) Volvox
 - (d) Chlorella
 - (e) None of these
- (vii) In Pakistan, Volvox is found abundantly in water ponds during the months of:
 - (a) March and April
 - (b) May and June
 - (c) November and December
 - (d) January and February
 - (e) None of these
- (viii) Because of extracting _____ from water and depositing it in their walls different species of Chara are referred to as "Stone Worts":
 - (a) Sodium chloride
 - (b) Calcium carbonate
 - (c) Potassium sulphate
 - (d) Potassium nitrate
 - (e) None of these
- (ix) Puccinia graminis causes _____ in wheat:
 - (a) Yellow or stripe rust
 - (b) Brown or orange leaf rust
 - (c) Black or stem rust
 - (d) Loose green smut
 - (e) None of these
- (x) The zero and one stages of Puccinia graminis are produced on:
 - (a) Triticum aestivum
 - (b) Hordeum Vulgare
 - (c) Sorghum Vulgare
 - (d) Barberis Vulgaris
 - (e) None of these
- (xi) A stable self-supporting association of a _____ is termed as lichen:
 - (a) bryophyte & a pteridophyte
 - (b) mycobiont & a phycobiont
 - (c) plant & animal
 - (d) gymnosperm & angiosperm
 - (e) None of these
- (xii) Equisetum is the only living genus that belongs to:
 - (a) Sphenopsida
 - (b) Caphalida
 - (c) Chlorophycophyta
 - (d) Pteropsida
 - (e) None of these
- (xiii) The genus Equisetum comprises about 25 species distributed world-over except in:
 - (a) Eurasia
 - (b) North America
 - (c) South America
 - (d) Australasia
 - (e) None of these
- (xiv) The members of class Filicinae in pteridophyta date back to _____ era:
 - (a) Mesozoic
 - (b) Paleozoic
 - (c) Cenozoic
 - (d) Cambrian
 - (e) None of these

BOTANY, PAPER-I

- (xv) Marsilea quadrifolia belongs to the group of plants known as:
(a) Lichens (b) Sedges (c) Ferns
(d) Shrubs (e) None of these
- (xvi) _____ show marked affinities with both Pteridophytes and angiosperms:
(a) Bryophytes (b) Hydrophytes (c) Gymnosperms
(d) Epiphytes (e) None of these
- (xvii) _____ has five leaves in the spur:
(a) *Pinus longifolia* (b) *Pinus excelsa* (c) *Pinus roxberghii*
(d) *Pinus wallichiana* (e) None of these
- (xviii) The resting period between pollination and fertilization in Taxus baccata may be:
(a) Five to ten months (b) Two to three months (c) One to two months
(d) Ten to eleven months
- (xix) In *Ephedra*, the oosphere undergoes repeated divisions to produce eight-celled:
(a) Zygote (b) Zygosphere (c) Endosperm
(d) Pro-embryo (e) None of these
- (xx) Double fertilization is a characteristic of:
(a) Gymnosperms (b) Bryophytes (c) Angiosperms
(d) Pteridophytes (e) None of these

PART – II

NOTE:	(i) PART-II is to be attempted on the separate Answer Book. (ii) Attempt ONLY FOUR questions from PART-II. All questions carry EQUAL marks. (iii) Extra attempt of any question or any part of the attempted question will not be considered.
--------------	---

- Q.2.** (a) Classify different groups of algae based on their habitat and pigmentation. (10)
(b) Write a note on the Economic Importance of Chlorophyta. (10)
- Q.3.** Fungi have great impact on our national economy. Explain their constructive and destructive roles with a special emphasis on agriculture sector. (20)
- Q.4.** What are lichens? Explain how lichens are not only beneficial for humans but also for the entire universe? (20)
- Q.5.** (a) Explain the general characteristics of Bryophytes. (10)
(b) Write a detailed note on mode of reproduction in *Marchantia*. (10)
- Q.6.** (a) Discuss the structure of strobilus and sporangia of *Equisetum*. (10)
(b) Explain the major resemblances and differences between Gymnosperms and Pteridophytes. (10)
- Q.7.** Explain the mechanism of pollination, fertilization and development of seed as well as seed dispersal in Angiosperms. (20)
- Q.8.** Write short notes on **ANY TWO** of the following: (2 x 10)
(i) Rules of botanical nomenclature
(ii) Chemo – taxonomy and Numerical taxonomy
(iii) Concept of Speciation



BOTANY, PAPER-II

TIME ALLOWED:	(PART-I) 30 MINUTES	MAXIMUM MARKS:20
	(PART-II) 2 HOURS & 30 MINUTES	MAXIMUM MARKS:80

- NOTE: (i) First attempt PART-I (MCQ) on separate Answer Sheet which shall be taken back after 30 minutes.**
(ii) Overwriting/cutting of the options/answers will not be given credit.

PART – I (MCQ)
(COMPULSORY)

Q.1. Select the best option/answer and fill in the appropriate box on the Answer Sheet. (20)

- (i) NADH from the Krebs cycle is approximately equal to:
 - (a) 2 ATP
 - (b) 3 ATP
 - (c) 4 ATP
 - (d) 6 ATP
 - (e) None of these
- (ii) In mitochondrial electron transport chains, the final electron acceptor is:
 - (a) H₂O
 - (b) H₂O₂
 - (c) NAD⁺
 - (d) FAD
 - (e) None of these
- (iii) The movement of water from cell to cell via plasmodesmata is called:
 - (a) Symplastic
 - (b) Transmembrane
 - (c) Apoplastic
 - (d) Facilitated
 - (e) None of these
- (iv) In maize plant, the CO₂ fixation mechanism is called:
 - (a) C₃ pathway
 - (b) C₄ pathway
 - (c) CAM pathway
 - (d) C₃ – C₄ intermediate
 - (e) None of these
- (v) Salt-loving plants are known as:
 - (a) Glycophytes
 - (b) Halophytes
 - (c) Xerophytes
 - (d) Mesophytes
 - (e) None of these
- (vi) With the addition of solute to a liquid system, the water potential of the system:
 - (a) Increases
 - (b) Decreases
 - (c) Remains stable
 - (d) Remains variable
 - (e) None of these
- (vii) The conversion of pyruvate into acetyl CoA is called:
 - (a) Glycolysis
 - (b) Fermentation
 - (c) Oxidative carboxylation
 - (d) B-Oxidation
 - (e) None of these
- (viii) Between adenine and thymine, there are:
 - (a) Two hydrogen bonds
 - (b) 3 hydrogen bonds
 - (c) One hydrogen bond
 - (d) 4 hydrogen bonds
 - (e) None of these
- (ix) The stage of meiosis in which pairing of homologous chromosomes starts is called:
 - (a) Leptotene
 - (b) Zygotene
 - (c) Diplotene
 - (d) Pachytene
 - (e) None of these
- (x) The site of chromosome on which a gene is located is called:
 - (a) Allele
 - (b) Locus
 - (c) Site
 - (d) Trait
 - (e) None of these
- (xi) In a dihybrid cross, the ratio of F₂ generation is:
 - (a) 9:3:3:1
 - (b) 3:1
 - (c) 1:2:1
 - (d) 1:1
 - (e) None of these
- (xii) When a single gene has multiple effects, the phenomenon is called:
 - (a) Codominance
 - (b) Epistasis
 - (c) Pleiotropy
 - (d) Genostasis
 - (e) None of these
- (xiii) Lamarck's theory of evolution was published in:
 - (a) 1807
 - (b) 1808
 - (c) 1809
 - (d) 1810
 - (e) None of these
- (xiv) The book "Origin of Species" was written by:
 - (a) Linnaeus
 - (b) Lamarck
 - (c) Mendel
 - (d) Darwin
 - (e) None of these

BOTANY, PAPER-II

- (xv) The interaction between algae and fungi to form lichen is called:
 (a) Parasitism (b) Mutualism (c) Commensalism
 (d) Amensalism (e) None of these
- (xvi) The actual location or place where an organism lives is called:
 (a) Habitat (b) Ecosystem (c) Niche
 (d) Biome (e) None of these
- (xvii) Which of the biomes has been increased in area by human activities?
 (a) Savanna (b) Grassland (c) Desert
 (d) Coniferous forest (e) None of these
- (xviii) Which zone of the lake ecosystem consists of phyto-and zoo-planktons?
 (a) Littoral zone (b) Limnetic zone (c) Profundal zone
 (d) Water deep layers (e) None of these
- (xix) Which of the following is a biotic component of an ecosystem?
 (a) Producers (b) Consumers (c) Decomposers
 (d) All of these (e) None of these
- (xx) A sequence of changes in the community structure of an ecosystem over a period of time is called:
 (a) Natural selection (b) Succession (c) Neo-Darwinism
 (d) Lamarckism (e) None of these

PART – II

NOTE:	(i) PART-II is to be attempted on the separate Answer Book. (ii) Attempt ONLY FOUR questions from PART-II. All questions carry EQUAL marks. (iii) Extra attempt of any question or any part of the attempted question will not be considered.
--------------	---

- Q.2.** (a) What is Oxidative phosphorylation? How does it take place on the mitochondrial membrane and how is it associated with the synthesis of metabolic energy? **(10)**
 (b) What is pigment? Give the structures and chemical composition of all plant pigments involved in photosynthesis. **(10)**
- Q.3.** Describe the structure, transport, biosynthesis and mode of action of Auxins. **(20)**
- Q.4.** (a) Differentiate between Dark Respiration and Photo-respiration. **(10)**
 (b) Describe the salient effects of water-logging on plants. **(10)**
- Q.5.** What is Ecosystem? How is its composition affected by different environmental factors? **(20)**
- Q.6.** Write notes on the following:. **(10 x 2)**
 (i) Genetic code (ii) Gene transformation
- Q.7.** (a) What are major factors which affect the evolution of a trait? **(10)**
 (b) Describe Ecological Energetics. **(10)**
- Q.8.** Write short notes on **ANY TWO** of the following: **(2 x 10)**
 (i) Photoperiodism (ii) Ultra-structure of chloroplast
 (iii) Conservation of Natural resources
